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from parents. The regulation of abnormalities in Hydra appears to be independent of external conditions, and seems to be rather an effect of certain qualities inherited by the organism.

P.

Notes. — The third edition of Van Gehuchten's[1] well-known text-book on the nervous system of man has just been published. The work has been increased in bulk and now appears in two volumes of about six hundred pages each. The first volume contains a full account of the gross anatomy of the nervous system, the neurone, and the finer anatomy of the spinal cord ; the second volume deals with the finer anatomy of the brain.

No. VII of Vol. III of the *American Journal of Physiology* contains the two following articles: "The Poisonous Character of a Pure NaCl Solution," by Jacques Loeb, and "Observations on the Degeneration and Regeneration of Motor and Sensory Nerve Endings in Voluntary Muscle," by G. C. Huber.

BOTANY.

Minnesota Plant Life.[2] — The broad scope of the botanical work that is being done in Minnesota by Professor MacMillan is evidenced by the present volume. *Minnesota Plant Life* is the third volume of the botanical series of the reports of the natural history survey of the state. Notwithstanding, the book is not only not at all technical in the accepted sense, but, in accordance with the avowed purpose of the author, it is presented in as untechnical and popular a form as possible. Every botanist is quite too familiar with the result of the usual popular presentation of any portion of the subject. Popular treatises on biological science, especially, have come to stand for everything that is loose in thought, inexact in treatment, and antique in doctrine. Matters have practically reached a point where no master in scientific thought will write a popular treatise, and where no mere dilettante is able to write a scientific one. Professor MacMillan's book is proof that it is possible to write popularly,

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[1] Van Gehuchten, A. Anatomie du système nerveux de l'homme, tomes i, ii. Louvain, 1900.

[2] MacMillan, Conway, Professor of Botany in the University of Minnesota. St. Paul, *The Pioneer Press*, 1899. 8vo, xxv, 568 pp. Four plates and 240 illustrations.

i.e., untechnically, and at the same time in a genuinely scientific vein. While one may not agree at every point with the detail of the text, he is struck by the fact that there is here no loose statement and antiquated theory, while rare inexactitudes are to be explained by the difficulty of presenting in popular form, which is always quasi-didactic, matters upon which botanists themselves are not harmonious.

The tenor of the volume is indicated by the author's purpose to present the plant world as an assemblage of living things. This is accomplished by presenting the different taxonomic groups morphologically, by treating generally of structures and functions from an adaptational standpoint, and by pointing out the main biological facts in plant association. The first two chapters, which are in many respects the best, the most suggestive ones in the book, deal briefly but in a clear, elementary manner with distribution, zonation and migration. Considering its brevity, the question of zonation is especially well handled. An objection that might be brought against the treatment in certain places (pp. 5, 9, and elsewhere) is that it is quite too teleological. The allegorical method of statement is certainly the readiest, and, among scientists, it is perhaps as good as any. Taken in connection with the appalling literalness of beginners, it is unsafe, and invariably leads to confusion, if not to error, in the consideration of purpose and design.

Chapters III–XL, constituting much the larger part of the book, are concerned with a survey of the groups of plants from the slime moulds to the composites. The part dealing with the cryptogams is especially good, noticeably superior to the portion given over to the flowering plants. The latter is fluent and readable, but the structural standpoint is predominant to the exclusion of many matters of interest. The latter fact is probably to be explained by the need of keeping the size of the volume within reasonable limits. The author is certainly right in placing the consideration of structure before that of function and adaptation. Had it been possible, however, a modicum of the two would have increased the interest and the suggestiveness of this portion. The chapter upon the bacteria is a model of its kind. The freshness of the matter, taken with its concise thoroughness, will make it the most interesting and instructive part of the book, not only to those to whom the work is addressed, but to many botanists as well. In Chapter XX the author has not been so fortunate in his treatment of seeds and their production. No exception can be taken to the statement, but the exposition will doubtless produce confusion in the subject for those who come to it for the first time. The same criticism holds elsewhere in the treatment of alternation of generations. Though both are confessedly stumbling-blocks for beginners, it seems certain that a development of these matters phylogenetically would have been more logical and more successful.

The consideration of adaptation to environment is comprehensive and replete with suggestions. Occasional inaccuracies creep in, and in a few instances doubtful or debatable explanations are presented as certain. The ecological factors considered are gravity, mechanical forces, heat, light, moisture, soil composition, and biological environment. Following this a chapter is given to the treatment of hydrophytes and one to xerophytes. Halophytes and mesophytes are also considered briefly. The treatment is good in the main, but in certain places it lacks coördination. This is doubtless due to lack of space, since the detail itself has apparently required pruning. The last two chapters deal with the intimate processes in the life of the individual and of the species. Protoplasm is treated of in a peculiarly striking and clear manner. Nutrition, growth, movement, protection likewise receive elementary treatment in simple logical fashion. The maintenance of the species, involving the phenomena and problems of propagation and reproduction, is clearly stated and is most suggestive.

Books, like people, are well dressed when the dress is not noticed. Until they attain this standard, however, it is a distinct pleasure to have to do with a book in so many ways faultless as the present one in the art of printer and engraver. When it is borne in mind that it belongs to the dubious class of "state-printed" books, it is at once seen how painstaking the author must have been to have produced a book of such uniform excellence of press-work and illustration.

It is novel and encouraging that a book of this sort should be published by the Board of Regents of a large university for the instruction of the people of the state. It is a distinct misfortune that the book is not on the market, as it should be found as a reference or reading book in all schools in which botany is taught.

FREDERIC E. CLEMENTS.

The Local Floras of New England. — In 1890 Dr. Britton published a list of state and local floras of the United States and British America, which has been of very great use to botanists working on the classification and distribution of our native plants. One hundred and six titles appear for the New England States. Miss